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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/904,355

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Allen He

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Corporate Patent Counsel
Philips Electronics North America Corporation
580 White Plains Road
Tarrytown, NY 10591

EXAMINER

FAN, CHIEH M

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,355

Applicant(s)

HE ET AL.

Examiner

Chieh M Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01212003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to. It is not clear how to derive equation 4 on page 6 from equation 3. Following equation 3, it appears that the second part of equation 4 should be $-(E_s/N)A_0 [2x(\hat{I}_i - \hat{I}_j) + 2y(\hat{Q}_i - \hat{Q}_j)]$ instead of $-(E_s/N)A_0 [2x(\hat{I}_i - \hat{I}_j) - 2y(\hat{Q}_i - \hat{Q}_j)]$. If the examiner is correct, the remainder of the specification and possibly drawings may be to be corrected accordingly. However, the applicants are advised that such correction may introduce new matter into the disclosure, which is not permitted. Further, it appears the variable \hat{I}_i in equation 4 is equal to the variable \hat{I}_i in equation 3 divided (or normalized) by the minimum amplitude A_0 . Therefore, the variable \hat{I}_i , which is represented by a same symbol, has different meaning in equation 3 and in equation 4. Appropriate correction is required.

Drawings

2. The drawings are objected to because: (a) $A_0(\hat{I}_i^2 + \hat{Q}_i^2) + A_0(\hat{I}_j^2 + \hat{Q}_j^2)$ in each of the blocks 218 and 224 of Fig. 2 should be $A_0(\hat{I}_i^2 + \hat{Q}_i^2) - A_0(\hat{I}_j^2 + \hat{Q}_j^2)$, (b) $LLR(m) * A_0/E_s/N$ in block 224 of Fig. 2 should be changed to $LLR(m) / ((E_s/N)*A_0)$, and (c) the output of block 432 in Fig. 4 apparently should be $-2y(\hat{Q}_i - \hat{Q}_j)$. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to

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avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 1-5 are objected to because of the following informalities:

Regarding claim 1, "the I component" in line 5 should be changed to --- an I component ---; "the Q component" in line 12 should be changed to --- a Q component --
-.

Regarding claim 2, " $2(|\hat{Q}_i - \hat{Q}_j|)$ " in line 2 should be changed to --- $2(|\hat{Q}_i - \hat{Q}_j|)$ ---; and "is stored" in line 4 apparently should be removed.

Regarding claim 5, "the I component" in line 5 should be changed to --- an I component ---; "the Q component" in line 12 should be changed to --- a Q component --
-.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the scope of claim cannot be determined. It is not clear to the examiner which parts described in the specification are referred to the claimed "means for determining a first value" (line 4 of claim 1) and "means for determining a second value" (line 11 of claim 1). The present invention is directed to the determination of the scaled log-likelihood ratio, which is equal to $[A_0(\hat{l}_i^2 + \hat{Q}_i^2) - A_0(\hat{l}_j^2 + \hat{Q}_j^2)] - [2x(\hat{l}_i - \hat{l}_j)] + [2y(\hat{Q}_i - \hat{Q}_j)]$ (see equation 5 on page 7 of the specification). Comparing the equation above with the claimed limitations, it is clear that the claimed "a first value" is referred to $- [2x(\hat{l}_i - \hat{l}_j)]$ and the claimed "a second value" is referred to $[2y(\hat{Q}_i - \hat{Q}_j)]$. Therefore, it is not clear which element is referred as the means for determining a first value, particularly when the means determines the first value according to the first value itself.

Similarly, it is not clear which element is referred as the means for determining a second value, particularly when the means determines the second value according to the second value itself. Further, Claim 1 recites the limitation "the minimum amplitude" in lines 16-17. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 3, claim 3 further limits the means for determining the first value comprises an adder and a sign inverter connected to the adder. It appears such limitations are directed to element 422 and 440 in Fig. 4. As shown in Fig. 4, the sign inverter 422 receives the signal $2x(|\hat{I}_i - \hat{I}_j|)$, and the adder 440 outputs $- ([2x(\hat{I}_i - \hat{I}_j)] + [2y(\hat{Q}_i - \hat{Q}_j)])$. Therefore, it is not clear how the claimed means for determining the first value would be consistent with the means for determining a first value recited in the parent claim (claim 1), which requires determining the first value according to the equation $- 2x(\hat{I}_i - \hat{I}_j)$. Further, as explained above in claim 1, the first value should be equal to $- 2x(\hat{I}_i - \hat{I}_j)$. It is therefore not clear how the output of the adder 440 would be consistent with the claimed limitation "determining a first value".

Regarding claim 4, claim 4 further limits the means for determining the second value comprises an adder and a sign inverter connected to the adder. It appears such limitations are directed to element 432 and 440 in Fig. 4. As shown in Fig. 4, the sign inverter 432 receives the signal $2y(|\hat{Q}_i - \hat{Q}_j|)$, and the adder 440 outputs $- ([2x(\hat{I}_i - \hat{I}_j)] + [2y(\hat{Q}_i - \hat{Q}_j)])$. Therefore, it is not clear how the claimed means for determining the first value would be consistent with the means for determining a first value recited in the parent claim (claim 1), which requires determining the second value according to the equation $2y(\hat{Q}_i - \hat{Q}_j)$. Further, as explained above in claim 1, the first value should be

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equal to $2y(\hat{Q}_i - \hat{Q}_j)$. It is therefore not clear how the output of the adder 440 would be consistent with the claimed limitation "determining a second value".

Regarding claim 5, the scope of claim cannot be determined. It is not clear to the examiner which parts described in the specification are referred to the claimed "determining a first value" (line 4 of claim 5) and "means for determining a second value" (line 10 of claim 5). The present invention is directed to the determination of the scaled log-likelihood ratio, which is equal to $[A_0(\hat{l}_i^2 + \hat{Q}_i^2) - A_0(\hat{l}_j^2 + \hat{Q}_j^2)] - [2x(\hat{l}_i - \hat{l}_j)] + [2y(\hat{Q}_i - \hat{Q}_j)]$ (see equation 5 on page 7 of the specification). Comparing the equation above with the claimed limitations, it is clear that the claimed "a first value" is referred to $- [2x(\hat{l}_i - \hat{l}_j)]$ and the claimed "a second value" is referred to $[2y(\hat{Q}_i - \hat{Q}_j)]$. Therefore, it is not clear which part of the specification is referred as the step for determining a first value, particularly when the step determines the first value according to the first value itself. Similarly, it is not clear which part of the specification is referred as the step for determining a second value, particularly when the step determines the second value according to the second value itself. Further, Claim 5 recites the limitation "the minimum amplitude" in line 15. There is insufficient antecedent basis for this limitation in the claim.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rhee et al. (U.S. Patent No. 6,807,238), Sindhushayana (U.S. Patent No. 6,594,318), Jeong (US 2002/0067777), Tosato et al. (GB 2,388,756).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.



Chieh M Fan
Primary Examiner
Art Unit 2634

cmf
November 2, 2004